THE CLAIMS:

This listing will replace all prior versions and listings of claims in the application.

1-54. (Canceled)

55. (Previously presented) A serum-free, eukaryotic cell culture medium comprising the ingredients N-acetyl-L-cysteine, 2-mercaptoethanol, human serum albumin, D,L-tocopherol acetate, soluble human lipids for serum-free media, ethanolamine, human zinc insulin, iron-saturated transferrin, Se^{4+}, hydrocortisone, Ca^{2+}, K^{+}, Mg^{2+}, Na^{+}, CO_3^{2-}, PO_4^{3-}, D-glucose, HEPES, sodium pyruvate, phenol red, glycine, L-alanine, L-asparagine, L-aspartic acid, L-glutamic acid, L-phenylalanine, L-histidine, L-isoleucine, L-lysine, L-leucine, L-arginine HCl, L-methionine, L-proline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, biotin, D-calcium pantothenate, choline chloride, folic acid, i-inositol, niacinamide, pyridoxal HCl, riboflavin, thiamine HCl, and vitamin B_{12},

wherein each of said ingredients is present in said medium at a concentration that supports the expansion of $CD34^{+}$ hematopoietic cells in suspension culture in the absence of stromal cells.

56-75. (Canceled)

76. (Previously presented) A method of expanding recombinant $CD34^{+}$ hematopoietic cells, the method comprising:

(a) contacting the cells with a serum-free medium; and

(b) culturing the cells in serum-free suspension culture, in the absence of stromal cells, under conditions that facilitate the expansion of the cells.

77. (Currently amended) The method of claim 76, wherein the serum-free culture medium comprises N-acetyl-L-cysteine ~~or derivatives thereof~~.

78. (Previously presented) The method of claim 76, wherein the serum-free culture medium comprises at least one component selected from the group consisting of 2-mercaptoethanol,

human serum albumin, D,L-tocopherol acetate, soluble human lipids for serum-free media, ethanolamine, human zinc insulin, iron-saturated transferrin, Se^{4+}, hydrocortisone, Ca^{2+}, K^{+}, Mg^{2+}, Na^{+}, CO_3^{2-}, PO_4^{3-}, D-glucose, HEPES, sodium pyruvate, phenol red, glycine, L-alanine, L-asparagine, L-cysteine, L-aspartic acid, L-glutamic acid, L-phenylalanine, L-histidine, L-isoleucine, L-lysine, L-leucine, L-glutamine, L-arginine HCL, L-methionine, L-proline, L-hydroxyproline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, biotin, D-calcium pantothenate, choline chloride, folic acid, i-inositol, niacinamide, pyridoxal HCl, riboflavin, thiamine HCl, and vitamin B_{12}.

79. (Previously presented) The method of claim 76, wherein the serum-free culture medium comprises 2-mercaptoethanol, human serum albumin, D,L-tocopherol acetate, soluble human lipids for serum-free media, ethanolamine, human zinc insulin, iron-saturated transferrin, Se^{4+}, hydrocortisone, Ca^{2+}, K^{+}, Mg^{2+}, Na^{+}, CO_3^{2-}, PO_4^{3-}, D-glucose, HEPES, sodium pyruvate, phenol red, glycine, L-alanine, L-asparagine, L-aspartic acid, L-glutamic acid, L-phenylalanine, L-histidine, L-isoleucine, L-lysine, L-leucine, L-arginine HCL, L-methionine, L-proline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, biotin, D-calcium pantothenate, choline chloride, folic acid, i-inositol, niacinamide, pyridoxal HCl, riboflavin, thiamine HCl, and vitamin B_{12}.

80. (Previously presented) The method of claim 76, wherein the serum-free medium comprises at least one component selected from the group consisting of a trace element, a glucocorticoid, an inorganic salt, an energy source, a buffering agent, a pyruvate salt, a pH indicator, an amino acid, and a vitamin.

81. (Previously presented) The method of claim 76, wherein the serum-free medium comprises at least one cytokine or at least one growth factor.

82. (Previously presented) The method of claim 76, wherein the serum-free medium comprises at least one glucocorticoid.

83. (Previously presented) The method of claim 82, wherein the at least one glucocorticoid is a hydrocortisone.

84. (Previously presented) The method of claim 76, wherein the cells are expanded at 37°C.

85. (Previously presented) The method of claim 76, wherein the cells are expanded for 6-8 days.

86. (Previously presented) The method of claim 76, wherein the cells are human cells.

87. (Previously presented) A method of expanding recombinant $CD34^+$ hematopoietic cells in serum-free culture, the method comprising:

(a) obtaining recombinant $CD34^+$ hematopoietic cells by introducing a nucleic acid construct into $CD34^+$ hematopoietic cells; and

(b) expanding the cells in serum-free suspension culture, in the absence of stromal cells, under conditions that facilitate the expansion of the cells.

88. (Currently amended) The method of claim 87, wherein the serum-free culture medium comprises N-acetyl-L-cysteine ~~or derivatives thereof~~.

89. (Previously presented) The method of claim 87, wherein the serum-free culture medium comprises at least one component selected from the group consisting of 2-mercaptoethanol, human serum albumin, D,L-tocopherol acetate, soluble human lipids for serum-free media, ethanolamine, human zinc insulin, iron-saturated transferrin, Se^{4+}, hydrocortisone, Ca^{2+}, K^+, Mg^{2+}, Na^+, CO_3^{2-}, PO_4^{3-}, D-glucose, HEPES, sodium pyruvate, phenol red, glycine, L-alanine, L-asparagine, L-cysteine, L-aspartic acid, L-glutamic acid, L-phenylalanine, L-histidine, L-isoleucine, L-lysine, L-leucine, L-glutamine, L-arginine HCL, L-methionine, L-proline, L-hydroxyproline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, biotin, D-calcium pantothenate, choline chloride, folic acid, i-inositol, niacinamide, pyridoxal HCl, riboflavin, thiamine HCl, and vitamin B_{12}.

90. (Previously presented) The method of claim 87, wherein the serum-free culture medium comprises 2-mercaptoethanol, human serum albumin, D,L-tocopherol acetate, soluble human lipids for serum-free media, ethanolamine, human zinc insulin, iron-saturated transferrin, Se^{4+}, hydrocortisone, Ca^{2+}, K^{+}, Mg^{2+}, Na^{+}, CO_3^{2-}, PO_4^{3-}, D-glucose, HEPES, sodium pyruvate, phenol red, glycine, L-alanine, L-asparagine, L-aspartic acid, L-glutamic acid, L-phenylalanine, L-histidine, L-isoleucine, L-lysine, L-leucine, L-arginine HCL, L-methionine, L-proline, L-serine, L-threonine, L-tryptophan, L-tyrosine, L-valine, biotin, D-calcium pantothenate, choline chloride, folic acid, i-inositol, niacinamide, pyridoxal HCl, riboflavin, thiamine HCl, and vitamin B_{12}.

91. (Previously presented) The method of claim 87, wherein the serum-free medium comprises at least one component selected from the group consisting of a trace element, a glucocorticoid, an inorganic salt, an energy source, a buffering agent, a pyruvate salt, a pH indicator, an amino acid, and a vitamin.

92. (Previously presented) The method of claim 87, wherein the serum-free medium comprises at least one cytokine or at least one growth factor.

93. (Previously presented) The method of claim 87, wherein the serum-free medium comprises at least one glucocorticoid.

94. (Previously presented) The method of claim 93, wherein the at least one glucocorticoid is a hydrocortisone.

95. (Previously presented) The method of claim 87, wherein the cells are expanded at 37°C.

96. (Previously presented) The method of claim 87, wherein the cells are expanded for 6-8 days.

97. (Previously presented) The method of claim 87, wherein the cells are human cells.

98. (New) A method of providing recombinant $CD34^+$ hematopoietic cells to a mammal comprising:

(a) expanding recombinant $CD34^+$ hematopoietic cells according to the method of claim 76; and

(b) introducing said recombinant cells into said mammal.